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# The development of information technologies in the sphere of housing service and utilities as a factor of national life quality increase

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## Abstract

There were considered housing and communal services in the article as it is the most important part of life sustainment infrastructure that defines comfort conditions of human life activities. There was stated Ineffective functioning of housing and communal services, which leads to a decrease in quality of life. There was identified a cause for the current situation which is the ineffectiveness of the management system, including the ineffectiveness of technical policy, the policy of energy conservation and resource efficiency, tariff and personnel policy.

It is suggested to implement new information technologies (IT) into the housing and communal services sector, namely geo-informational system, to solve management system problems and to increase the effectiveness of functioning of housing and communal services system. The author set the main goal of implementation of geo-informational system into the management of housing and communal services, namely development of housing and communal services system basing on the application of innovative development, development of communication between different government authorities, resource-providing organizations and citizens, as well as increase of life quality. The article states the purpose of the geo-informational system, which is automation of cooperation of all subjects at the national housing and communal services system market, householders' societies, managing companies, resource-providing organizations and government authorities. There were considered advantages of geo-informational system for all housing and communal services system market insiders. There was given a description of geo-informational system functioning process.

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## 1. Introduction

Improvement of the national life quality is now a key public policy issue of the Russian Federation. The most important practical step in this direction was the adoption of priority measures for the use of information technologies

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to improve the life quality in various spheres of the national economy, including the housing and communal services (HCS) at a meeting of the Government Commission on August 6, 2014 (The Russian Government, 2014).

Housing and communal services is a branch of the municipal economy and an essential part of life sustainment infrastructure, defining the comfort of human life activities. The state of health, quality of life, culture, way of life and life style of the population depend on the quality and reliability of housing and communal services and largely determines the social-economic potential of municipalities.

The modern period is characterized by active reform activities on transformation of housing and communal services in Russia. HSC reform is focused on institutional reforms in the sector, which should help to reduce costs and improve service quality. The main objectives of the reform are to increase the efficiency, stability and reliability of functioning of the national life sustainment utility systems, and attraction of investments in municipal complex in terms of the services quality improvement at lower costs produced.

However, the experience of the past twenty years, starting with the Concept of reforming of housing and communal services of 1992, testifies to the fact that significant progress in this direction has not been reached yet. A weak reflection of the primary objective, which is management improvement, is a serious disadvantage of programs on reformation of the housing and communal services sector

It should be noted that the management should ensure the appropriate ordering of the related system, its integrity, normal functioning and development. When analyzing statistical data, scientific researches and media coverage it may be concluded that the above mentioned features are absent in the housing and communal services complex. Therefore, the drawn-out reform and the absence expected results are the consequences of ineffective management.

The currently existing system of housing and communal services is ineffective because of ineffectiveness of technology policy, energy conservation and resource policy, tariff and personnel policy. The consequence of all this is the growing crisis in the functioning of housing and communal services and national dissatisfaction in the quality of services provided.

## **2. Main part**

The main purpose of effective management of housing and communal services should be stable provision with quality housing and communal services at the prices affordable for the nation. In order to ensure this objective is achieved it is necessary that all of the elements of control action (technical policy, energy and resource efficiency policies, financial policies, personnel policies) have their tasks and are focused on objective's achievement (Minaev, Kolyhaeva, Seliverstov, Shadeiko, 2014).

One of the mechanisms for the solution of this situation is the development of information technology in the sphere of HCS. The introduction of new information technologies should improve the national quality of life and improve the conditions for business development, improve governance and ensure the transition to an innovative economy. Innovative development of the Russian economy will redevelop its structure as a whole, and individual sectors in particular. One of the main tasks of the innovation development of HCS is the introduction of information technologies.

Nowadays, the automation of management processes in the HCS is at a quite low level, which results reduce in the efficiency of the industry as a whole. The first step to be made on the way to the innovative development of the industry should be to create a geo-informational system.

Geo-informational system is a multifunctional information system designed for collecting, processing, modeling and analysis of data on all subjects, objects and processes of HCS functioning at municipal entity, their display and use when solving management problems, preparing and making management decisions on by control subjects of HCS.

The basic unit of the system is a multi-dwelling unit. It accumulates information such as: characteristics of the unit (including membership in the emergency housing stock), readings (the consumption of housing and communal services) of individual and unit-level meters, a form of management of the multi-dwelling unit, maintenance and resource-providing organizations, various events, issues and many other options.

It is the purpose of creation of a geo-informational system to develop HCS on the basis of innovative development, the development of cooperation between the government authorities, citizens and resource-providing organizations, and improvement of the national quality of life.

The most important feature of this system is a function of completely automated reading, reporting and accounting of utility resources and services consumed which are widely used in the management of HCS in the developed world.

Geo-informational system is designed to automate the interaction of all the subjects at the HCS market. The system provides its advantages for each of the entities.

Tenants are given with tools that allow them to improve their literacy, to interact with other participants of the system and address the major issues in managing of their dwellings or their property such as: to transmit meter readings, pay receipts for housing and communal services, to hold general meetings, to monitor developments in house online at the related source.

Householders' societies are offered with daily automation of house management tasks, such as calculation of charges for housing and communal services, the formation of receipts, receiving of meters readings and payments of HCS receipts, holding of general meetings and other mechanisms of interaction with residents.

Resource-providing organizations and management companies are provided with tools to inform residents and reveal the public opinion, as well as to carry out receiving of meters readings and make payment of HCS receipts.

Government authorities are offered with a public reception and the ability to monitor issues, collect statistics in the sphere of HCS, as well as spot provision of information to the public and carrying out the necessary surveys.

When considering the involvement of all HCS subjects in geo-informational system, it can be said that the system is a single interface of interaction between these subjects, which accumulates all kinds of their interactions.

Scheme 1 shows generalized scheme of functioning of geo-informational in the HCS management.

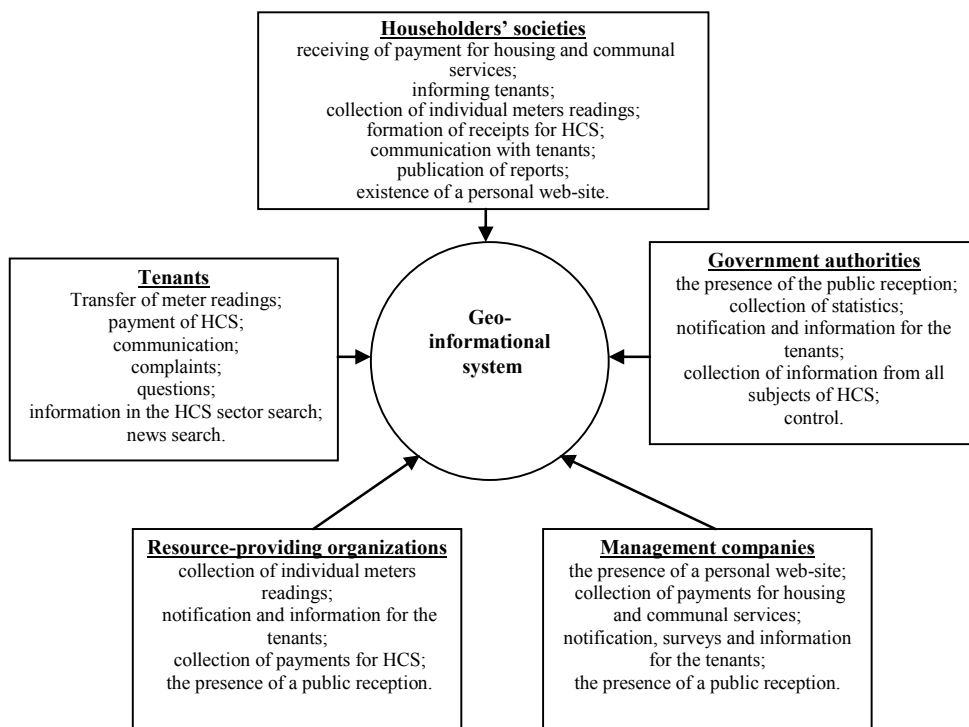


Fig. 1. The generalized scheme of functioning of geo-informational in the HCS management

The use of geo-informational systems in HCS can solve problems arising in the process of management. For example, the use of automated householders' society management system in automatic mode implements the following functions:

1. collection of individual consumption meters readings;
2. account of unit-level consumption meters readings;
3. keeping of personal accounts and debts accounting;
4. online collection of payment;
5. tracking of changes of HCS tariffs;
6. housing and communal services charges calculation
7. forming and print-out of receipts on housing and communal services.

Scheme of Householders' society - Tenants interaction within a geo-informational system is as follows (fig. 2):

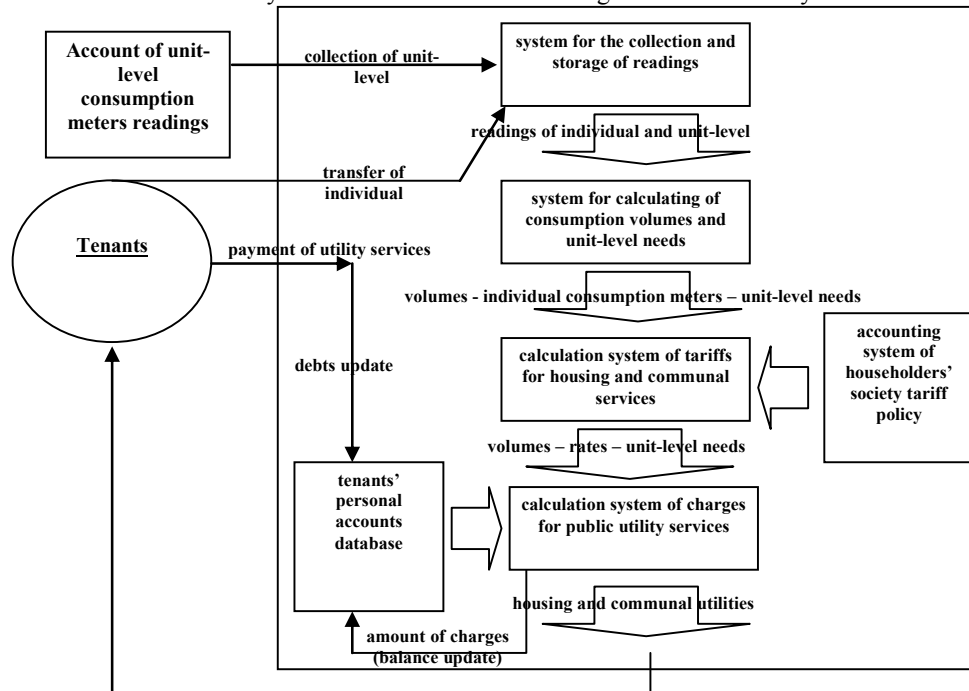


Fig. 2. Scheme of Householders' society – Tenants interaction within a geo-informational system

The implementation of this scheme allows the chairmen of householders' society to abandon the services of cash settlement centers completely, as well as reduce the burden on accountants / cashiers.

Utility rates are updated on a service level, so the chairman of householders' society does not need to keep track of changes in tariffs.

The social component of the project provides an opportunity to improve communication between tenants, house administrator and resource-providing organizations.

Due to the fact that the basic unit of geo-informational system is a multi-dwelling unit, where the communication is centered, tenants of the multi-dwelling unit can just publish a problem in the profile of the unit for the responsible house-administrating or resource organization to respond it.

Calendar of events in the user's profile accumulates all the important events of all resource and house administrating organizations belonging to the unit, in which the user is "registered". This allows tenants to be aware of major events and comply with the terms of payment and transfer of individual meters readings, while resource and house-administrating organizations to reduce operating and financial costs of public awareness.

The main competitive advantage of the project is a new way to engage potential buyers, which is based on the free provision of online services.

### 3. Conclusion

As a summary, it can be said that the effective functioning of HCS largely depends on the national life quality. Inefficiency in functioning of the related sector of the Russian economy is largely due to the large number of administrative problems. One of the mechanisms for the solution of this situation is the development of information technology in the sphere of HCS., namely the creation of a geo-informational system.

Geo-informational system is designed to automate the interaction of all subjects of HCS market, therefore solves a lot of problems that arise in the management process.

Thus, the first step to be taken towards the development of innovative housing and communal services should be the introduction of new information technologies that will increase the quality of life, improve conditions for business development, and enhance the efficiency of public administration.

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